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# BETTER FRUIT

VOLUME XIII

DECEMBER, 1918

NUMBER 6



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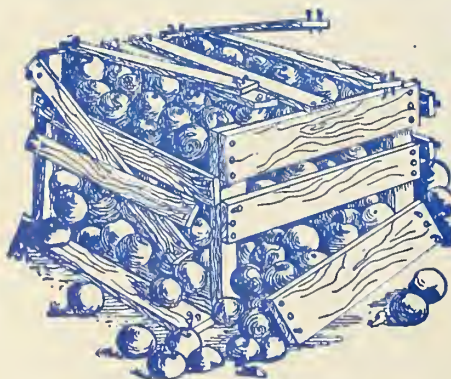
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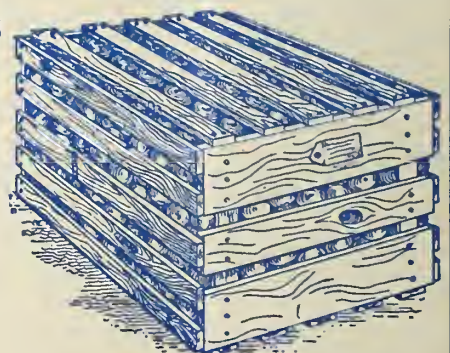
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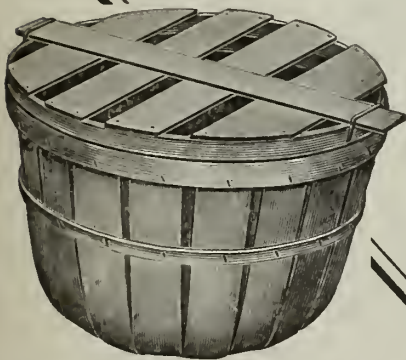
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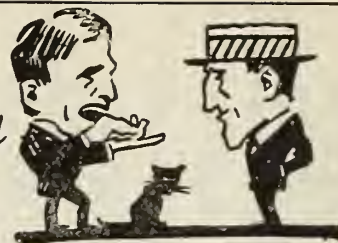
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## Pruning the Sweet Cherry

O. B. Whipple, Bozeman, Montana

**I**N presenting a discussion upon the subject of pruning the sweet cherry I am aware that there are still those who believe that cherry trees should not be pruned. But surely the number who hold this view is growing smaller each year,—at any rate we are too far advanced in these days to believe that a rational system of pruning is harmful to any fruit-bearing plant. If we do not get results in pruning, it is because the system and not the theory is wrong. The subject of sweet cherry pruning needs more study and the material here presented will, I hope, be helpful to those who are really interested in pruning this particular fruit. We may say that a tree is well pruned so long as it thrives and a desirable fruiting habit is maintained. A pruning practice does influence fruit-bearing, and I believe that a careful study of the fruiting wood of a tree will indicate whether the tree has or has not been properly pruned.

To be a good pruner one must be a good observer and we should cultivate the habit of studying the plants we are pruning. Like all stone fruits, the sweet cherry responds promptly to proper pruning and is a most interesting subject of study for the pruning student.

This tree bears its fruit from axillary fruit buds. In other words, the fruit buds are developed in the axils of leaves on the current season's growth and

these buds open the following season, and the fruits are born in clusters along these twigs, which may be properly referred to as one-year-old wood. Terminal buds are, with very few exceptions, branch buds, and these continue the growth of spurs or branches the following year. These fruit buds are born upon two types of one-year-old wood—on short spurs as shown in Figures 1, 2A, 3B and other cuts where short spurs bearing groups of buds are shown, and at the base of longer growths as shown in Figures 1, 4 and 5 and indicated the letter x. So far as fruit production is concerned, it is then measured by the amount and vigor of these two types of fruiting wood which the tree bears.

Spurs especially are inclined to be weak and unfruitful if the pruning of the tree is neglected. Too many spurs are thus left and many are either barren or bear only one or two fruit buds. Such spurs are well illustrated in Figure 4 and also in Figures 2B and 5. Good types of fruiting spurs are shown in Figures 1, 2A, 3B, 5, 6 and 7. The other type of fruiting wood is also absent in badly neglected trees. Strong terminal growths are not only desirable from the standpoint of immediate fruit production, but the axillary branch buds born upon these one-year-old twigs give rise, when the tree is properly pruned, to strong, fruitful spurs



FIGURE 4—Four-year-old branch of Bing.

like those shown in Figures 1 and 2A. These one-year-old spurs are very desirable fruiting wood, but old spurs like the one shown in Figure 3B may be maintained in a vigorous state by proper pruning. This spur is five years old, has borne annual crops, and is still in good vigor, for it bears six or seven good strong fruit buds. Vigor of fruiting wood is then maintained by pruning. If one should study a tree and find much wood like that shown in Figure 4\* he would know that the tree had been under-pruned. This branch is four years old. It has borne very little fruit and for a branch five feet in length it bears very few fruit buds. It has each year made a good annual growth and during the last three years has borne

\*Footnote.—Where the letters A, B, C, etc., appear twice on the face of any cut, the reader may, in his mind's eye, assemble the branch by placing the ends marked with the same letter together. The branches were cut for convenience in photographing.



FIGURE 1—Bing fruiting wood, natural size.

FIGURE 2—One-year-old spurs fruitful and barren.

FIGURE 3—Spurs one and five years old.





FIGURE 5—Strong and weak fruiting wood of Napoleon.

some fruit buds at the base of this one-year-old wood. But the real trouble has been that no vigorous, fruitful spurs have developed, and the reason for this is lack of pruning. Too many branch buds have been left to grow into spurs, and as a consequence none of these spurs has had sufficient nourishment to develop them into strong, fruitful spurs. Had the one-year-old growth been clipped back each pruning season, leaving from three to five branch buds, strong fruiting wood like that shown in Figures 6 and 7 would have developed. The secret of sweet cherry pruning,



FIGURE 6—Strong fruiting wood of Bing, result of annual heading in of one-year-old wood.

so far as fruit is concerned, is to clip in each spring the growth of the previous season to a point where only as many branch buds remain as will develop into strong spurs. The number of buds left will vary some with the age of the tree, the fertility of the land, and soil moisture conditions. The results shown in Figures 6 and 7 are about what we should strive for. In these instances the number of branch buds left has been from three to six. In each case one or two strong twigs have developed as a result of the clipping back and the other branch buds have developed into spurs. At least one strong twig should be forced out by this pruning, and if other spurs grow to the length illustrated in Figure 3A one should not consider that the tree has been over-pruned. This spur bears five axillary fruit buds and three axillary branch buds. In the top of the tree



FIGURE 7—Good Bing fruiting wood, showing how it should be headed back.

more branch buds may be left than in the center or about the outside of the tree. From the standpoint of economy in picking, the tree should be clipped back just as much as it will stand without forcing too many of the remaining branch buds into long shoot growth. Had the branch shown in Figure 4 been properly headed back from the beginning, it would now be less than two feet long when pruned for its next season's growth. As it is, it is over four feet long. The branch shown in Figure 6 is the same age and would be just two feet long to a point three or four buds below the cut marked A, which would be the proper point to head back to. The branch in Figure 4 carries a total of twenty-one fruit buds and that shown in Figure 6 approximately sixty. Which is the more profitable, pruning or no pruning?

The appearance of older spurs will also indicate whether the tree is being pruned sufficiently. In Figure 5 the



FIGURE 8—Five-year-old Bing before pruning.

twig on the left shows spurs well filled with fruit buds, which indicates good pruning, so long as there are no barren spurs like those shown in Figure 2B below them. The twig on the right shows spurs very sparingly filled with fruit-buds. A tree bearing wood of this kind needs more clipping back; too many branch buds are being left.

How, then, shall we approach and prune the sweet cherry tree? First, the strong terminal one-year-old twigs should be cut back, leaving from one to five or six branch buds, depending upon the vigor of the fruiting wood below—the weaker the fruiting wood, the fewer the branch buds left. One must not remove all the branch buds from such twigs, for they will then have no means of continuing their growth. Branch buds are readily distinguished from fruit buds by their shape and size. The two lateral buds nearest the tip in Figure 3A have the typical form and size of branch buds, while those at the base are typical fruit buds. If this pruning does not reduce the fruiting wood sufficiently, we must then remove older



FIGURE 9—Same tree after pruning.



wood. For the sake of renewing fruiting wood in the center of the tree, older branches may be cut back to any lateral spur. This will force strong new wood from the tips of the spurs remaining and upon this wood new spurs may be developed. Some branches may interfere and will need cutting out. The tree may get too thick in the center, and here again loss of vigor in the fruiting wood is the best indication of crowding.

Figures 8 and 9 illustrate how such principles are followed out in pruning. These are before and after taking. By

such a system of pruning we reduce to a minimum the unfruitful branches which are so often conspicuous in the framework of the cherry tree, we maintain the fruiting area near the ground, as contrasted with the long, willowy type of unpruned tree, and we develop strong fruit spurs, each bearing a goodly number of fruit buds, and these strong fruit buds bear large rather than small clusters of fruit. Not only do we produce better fruit and more fruit, but we develop a tree and a type of fruit cluster which mean economy in picking.

## The Value of Fruit in Human Nutrition

By Dr. S. J. Crumbine, Secretary State Board of Health, Topeka, Kansas

WE have only to go back to Genesis to find the first mention of fruit as a diet, and how and when the human race strayed away from that diet we do not know; but it is self-evident that they did, for the great majority of the human race are meat eaters. That fruit was intended to be eaten we know not only from the taste of pleasure that it gives one when eating it, but also from observation of the effect on the human system and from experiment. It has been discovered that fruit is a very essential part of the diet of the human race in some form or other. We find that in the portions of the world where it is most needed nature has profusely provided it, and there we find it growing most luxuriantly. In the tropical climates we find it growing in luxuriance where the consumption of meat is the least needed, and in the colder climates we find it less abundant, and the need for a meat diet that much more demanded. The refreshing part of fruit lies in the acid flavor, and the acid has a very important place in the human nutrition. While it is true that from a caloric standpoint the measure of fruit is not great, is not highly concentrated, yet as a matter of fact it carries a considerable amount of nutrition at least in sugar which the fruit contains. It also contains a small proportion of

the other essentials—hydrocarbons, proteins and fats. I think it can be fairly said that fruits are as nutritious from the calory standpoint as that of green vegetables. I am speaking of fruits in general, not certain kinds of fruit, and of vegetables in general. Also that the various dried fruits contain as much nutrition as dried vegetables. When it comes to the matter of preserved fruits, that is a different proposition. They are highly condensed by reason of the addition of sugar. So important has the matter of fruit become that in the feeding of an army and great bodies of men, where highly concentrated food is necessary, fruit in some form has become one of the main features of the supplies. You cannot think of the British soldier without fruit in some form—marmalade, jelly, or something of the kind. That is just as much as anything else a part of his army ration. It remained for an old sea captain to discover the uses of fruit and the necessity for it on a long sea voyage. The scourge of scurvy, which was the bane of the mariner, has been obliterated by the use of fruits. We have come to understand that the place of fruit in human nutrition is a place that cannot be filled by anything else. It is absolutely necessary for the greatest nourishment and good health.

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Fruit is important for more than the matter of the mere nutrition that it affords. The sugar and hydrocarbons, or carbohydrates, the proteins and fats and the mineral salts, all are important. The fruits are also essential by reason of the flavors alone. Physiologists have found out that one of the important elements in nutrition is the flavor which the fruits carry. That has been demonstrated by experiment. The effect of the flavor is in the action on the digestive juices. Otherwise it has been demonstrated that foods from which the flavor has been removed, or in which it was very slight, has impaired the digestive machinery. The flavor of the food has an extremely important part in the matter of nutrition. Nothing has so delightful a flavor as ripe fruit. Like the skin of the apple, ripe fruit contains ether and essential oils. What is more appetizing than a ripe apple? The other day I placed some apples in the grip which I carried, and one of them remained there only about a day. I packed my grip about two weeks later, and it still retained the odor of the apples. It was like opening the door to the apple cellar. So the delicious flavor and odor of the ripe fruit is an important factor in the digestion of our food and excites the action of the digestive juices. We have the flavor of the fruit as one of the things which goes to help in the digestive actions. Probably the king of all the fruits is the apple. It contains a maximum amount of sugar—only a few of the fruits containing more, grapes being one of them—and a large amount of free acids in available

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form. Apples contain 8.55 per cent of sugar; cherries, 9.95 per cent; peaches about the same; grapes, 14.95 per cent; strawberries, 6.24 per cent, with 1.1 per cent of free acid; oranges, 5.65 per cent, with 1.35 per cent free acid. Currants contain the largest amount of acid, 2.24 per cent, and 6.44 per cent of sugar. All of the foods that contain any considerable quantity of sugar carry with them a delicious flavor, and also contain the acids which are essential to the bodily well-being.

Cooked fruit is more digestive than ordinary raw fruit, by reason of the cellulose being softened and more easily attacked by the gastric fluid.

Of what particular value is the acid in the fruit? Simply to give us an appetite, or has it a real value in human nutrition? It has a very great value. What I wish to say in relation to that I can speak of only in a tentative fashion, because that subject is now under investigation by the research committees of the world. It is difficult to explain in a simple manner. Perhaps you have never thought of it in this light before—that life processes themselves are necessary to maintain the alkalinity of the blood; it is impossible for it to be-

come neutral and life continue. Probably the condition before death is that of acidosis, and when the blood continues to become neutral then life no longer continues. The fruits which we eat have a tendency to produce an acid combustion in the body in the way of discharges of the bowels, both of which are acid. Well, you may say, if you take the acid in the fruits when there is an acid condition in the body, that will make matters worse. It is one of the mysteries of chemistry that to increase the alkalinity of the blood you take fruit acid. That is what happens. And thus we understand why it is that a child with a diarrheal disease is given fruit acid, fruit juice, especially that of orange. You mothers will understand that they thrive on the orange juice, and it is a fact that on the theory of the alkalinity of the blood you give orange juice. The chemists will understand that. So that we not only find that the fruit juices are necessary in keeping up the body, but that they are necessary for the maintenance of life itself.

There is another value which I think can be called a nutritive value, and that is the effect upon the bodily secretions. There is no better remedy for several

of the ills of the human race than plenty of fruit. We all ought to eat a little of it. We are all too much of a class of meat eaters and eaters of solid food. The old adage of "an apple a day keeps the doctor away" has some basis in science. That is more than a mere superstition. It is stimulating on the bowels and helps to keep the system cleaned out; so that you have the question of keeping of the blood in condition and the exciting of the digestive secretions, both of which are of more importance than the mere nutritive value of the food itself.

It is to the credit of a Kansas man to have discovered two important elements in nutrition, which the discoverer calls "unknown A" and "unknown B," and by experiments on rats, mice, horses, cows and other animals he has been able to demonstrate the existence of these substances. He has discovered that the so-called balanced ration, if deprived of this unknown quality, will not sustain life. Animals fed on it grew to about half the usual size and then died; they could not suckle their young. He has discovered positively that to this balanced ration there must be added this unknown substance. The first of these is found in fats and the latter in fruits, and from this we are beginning to understand why the fruits are so beneficial to use in the menu of life. So we begin to understand why it was when the German man-of-war was interned at Norfolk more than seventy of her crew were found to be starving in the midst of plenty of food. Because they had not been able to get any fresh fruit or vegetables. Their ship was loaded with canned goods. As soon as the sailors were permitted to have fruit and vegetables their health was soon restored. So that I believe that the raisers of fruits are contributing not only to the pleasure of the people in the matter of the taste of the fruits which they produce, but we find that the fruits are a necessity in the matter of maintaining life itself. Even the Eskimo, who during the long winter lives on the fat and blubber, when the spring comes the first thing he does is to search for the cranberries and other small fruits that grow up there. I do not believe that they could exist without them. They must have the fruits in order that the balance of alkalinity in the blood can be maintained.

So that your business is tremendously important, and we are beginning to understand the value of the fruit that you raise. Fruit and vegetables should, therefore, form a part of our daily food, and in the interest of our good health we should not be deprived of them for even a single day.

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desires to announce cancellation of all clubbing offers appearing in late editions of BETTER FRUIT.



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No. of acres ..... Kind of fruit grown.....

**Bean Spray  
Pump Co.**

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## Novel Method of Fertilizing

By M. C. Potter, Iowa.

About three years ago I set out some fruit trees for Mr. Ernst, one of our neighboring farmers. The holes for these trees were blasted when the ground was dry. They were blasted in the fall and left open throughout the winter, the trees being planted the following spring.

About four and one-half feet from where the trunk of each tree would be when set, I put down four bore holes about four and one-half feet deep, spaced about equally distant apart so as to have one hole on each of the four sides of the tree. The dirt was cleaned out of these holes, which were then filled with rotten wood, leaves and manure. A great many corn cobs were mixed in the compost, because the object was to keep the soil open and improve the drainage as well as fertilize the feeding beds of the trees.

This compost settles in the holes, which we believe in filling with new material so as to keep them constantly full to the surface.

If trees were set on the side of a hill, the method of fertilizing above described doesn't fully answer the purpose. For side-hill trees we use two compost holes, put down about four feet out from the trunk of the tree, both holes being above the tree—that is, on higher ground.

We find it a big advantage to place our fertilizer in holes in the manner I have described because it doesn't wash away, as is the case when it is spread upon the surface of the ground.

## Grow a Winter Cover Crop

An important feature of orchard management that should engage the attention of fruit growers at this season is the planting of cover crops. It has been demonstrated beyond question that the most needed thing in the soils of Arizona is humus, and particularly is this true with reference to our orchard lands which in most cases are light and sandy. The presence of humus makes a soil better aerated and enables it to retain a greater amount of moisture—an item of no little consequence to the fruit grower as well as the general farmer.

While anything will produce humus "from a broom straw to a fence rail" if turned into the soil, the cheapest and most satisfactory method of supplying this material is through the growing of cover crops. Furthermore, if leguminous covers are used, an added value is secured in that nitrogen, the element of plant food most lacking in our soils and most needed in the development of tree growth and size of fruit, is supplied. Among the leguminous cover crops that might be planted during October are Crimson clover, Bur clover, Sour clover (*melliotus Indica*), Vetch and Canadian field peas. Non-legumes are rye, barley and oats. Do not deprive your orchard of the benefits to be derived from the growing of one of these crops. Plant it now.—F. J. Crider, Horticulturist, United States Agricultural Experiment Station.



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easy driving when the tools are hitched far off center.

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Name.....

Street.....

City.....

County..... State.....

No. of Acres..... Kind of crops grown.....



# BETTER FRUIT

An Illustrated Magazine Devoted to the Interests  
of Modern Fruit Growing and Marketing.  
Published Monthly  
by

**Better Fruit Publishing Company**

407 Lumber Exchange  
PORTLAND, OREGON

## TWO GRADES OF APPLES.

What promises to be the most interesting conference ever held in connection with the fruit industry of the Northwest will take place in Spokane December 10 to 13, when the Washington State Horticultural Association, the Inland Empire Fruit Growers' Conference and the Washington State Grade and Pack Conference will hold a joint meeting. A splendid program has been prepared and some interesting exhibits will be shown. For some years the University of Idaho has been working on a series of experiments in cross-breeding of apples and will have a most interesting exhibit showing definite results. The Washington State College is preparing a very complete exhibit featuring by-products of the fruit industry.

Several years ago BETTER FRUIT discussed the subject of two grades of apples, and at that time the Editor stated he believed that a plan could be adopted that would meet with the satisfaction of all growers in the Northwest. Many growers believe that two grades are sufficient—the first grade to be Extra Fancy and the second to be the Fancy and "C" grades combined. This matter was discussed at a conference held in Spokane at the National Apple Show two years ago, but very little was accomplished.

The Washington State Grange and Pack Conference will take up this subject thoroughly. The question of a two-grade pack will come before the growers and shippers to be either rejected or accepted. For two years the Federal Government has been working on the subject of standard grades, which has been largely handled by Mr. Bodinhouse of the Bureau of Markets. A complete questionnaire in regard to the proposed changes in the apple grade and pack has been sent to 4,000 growers in the Northwest and the answers will be used as a basis for the proposed Federal grading law.

Some growers feel that four grades are too many, while other growers contend they have a market for the present number of grades and the lowering of our grading would mean that Northwestern apples would lose their present high standard. The proposed Federal regulations call for virtually a two-grade pack. There would be no change in the first grade—the standard of Extra Fancy would be maintained absolutely. The Fancy and "C" grade would be combined—some have suggested this be termed "standard." If two grades are to be packed, this would take all of what is packed as Fancy and a proportion of "C" grade that is first class, to include the healed worm stings, but eliminating the uncolored apples of the red or striped varieties. This would

mean there would be a third grade, but the quality of this grade would be so poor that in normal years practically all of this grade would go to the by-products factories. The question of scab and color will be difficult to contend with. Under the proposed Federal grade the scab or combined scab on any apple would have to come within one-quarter of a square inch to be included in either of the first two grades. If it had more than this it would have to go in with the cooker. The fruit growers of the Inland Empire do not suffer so severely with fungus, and they do not have to contend with colors as much as the fruit growers along the Columbia River, but they do have more healed-over worm stings.

It is a well-known fact that the adoption of standard grades with the inspection service will eliminate to a large extent the risk now assumed by the buyer and seller in doing business on f.o.b. basis. When a buyer is depending on a supply of apples for his customers and is forced to reject a car

**Better Fruit  
Wishes  
Every Subscriber and  
Every Advertiser  
A Merry Christmas and  
A Happy New Year**

because of improper grading his loss is heavy. On the other hand, very often a car is rejected without just cause and the shipper loses. The Government is anxious to assist us to standardize our packs—it has no intention to penalize the fruit growers of the Northwest, and it is hoped that every district will send representative men who are fully competent to present their views so that the meeting in Spokane will be well attended and the subject thoroughly discussed.

**Spray Materials.**—Fruit growers in some districts of the Northwest suffering severely from codling moth in 1917 learned a lesson. In the season of 1918 they used good power outfits, purchasing the best brands of spray and followed a rigid spraying program, with the result they have a wonderfully clean crop. Other districts in the Northwest were not so careful. For some reason certain sprays were omitted and the loss from codling moth will be very heavy. When a grower receives his check for his Extra Fancy and for his culls he will realize the value of efficient spraying. In some sections more applications are required than in other sections, but there is no reason in the world why every district should not be cleaner and more free from worm stings than it is, which is all due to lack of spraying. There is nothing that prevents consumption or hurts the apple industry more than poor and

wormy apples going on the market. But one word more of advice. Every grower should purchase his spray material early. Don't put it off until you are ready to spray, because then the supply may be so diminished you will not be able to purchase the special brand you are seeking.

**Fruit growers need not worry about the car situation this year.** Word has been received there will be plenty of refrigerator cars available for moving the crop, but a warning is issued that cars must be loaded to their capacity.

**Mr. W. M. French, president of the International Apple Shippers' Association,** who has been very actively identified with the movement of sending apples to the American soldiers in Europe, is advised it will be impossible to send apples across this year. It is a disappointment to many here as well as to the boys across the sea, and while conditions may develop that some action may be taken later toward sending a shipment it is very unlikely. Last year the International Apple Shippers' Association sent a gift of a big shipment, and the many hundreds of letters received from the boys who were fortunate enough to receive one or more was evidence that the gift was appreciated.

**Lady-bugs to Assist in Exterminating Aphis.**—The Bureau of Entomology, in connection with the Forestry Service, will locate the caches of lady-bugs, to be used in Oregon and Washington to assist in exterminating aphis. In some parts of California lady-bugs have been found to be of inestimable value in aiding the growers, and it is hoped the growers of Oregon and Washington will derive good results. The lady-bug, which is really a beetle, congregates early in the fall, remaining inactive in large colonies. They have a red body with black spots and are from one-eighth to one-fourth of an inch in length.

**Mrs. Hulda Shepard of Chelan, Washington,** has perfected a process whereby apple butter is made into bricks. The apple bricks are wrapped in oil paper and can be shipped to all parts of the world, as they keep indefinitely. A company has been organized, known as the Shepard Fruit Products Company, which has erected a plant and machinery will be installed, so that work will commence immediately. Many apples that ordinarily would go to waste can be turned into this fruit product, netting the grower a good profit.

**The National League of Commission Merchants** will hold their twenty-seventh annual convention in Boston, January 7, 8, 9 and 10, at the Copley Plaza Hotel. There will be some splendid speakers and topics of such vital interest will be discussed that no member of the produce line can afford to miss. Mr. Cecil H. Cummings is in charge of the entertainment committee and a good time is promised to all.



The Selah Evaporating Company, Selah, Washington, is consuming twenty tons of green cull apples a day, producing two and one-half tons of dried product. The Selah Evaporating Company, which is owned and controlled by the growers of Selah, is in a most prosperous condition and is being well patronized by the growers.

**Currant Maggot.**—One of the best ways to control currant maggot is to stir the ground around the bushes in the autumn and in the early spring. The larvæ of this fly are in the ground and by stirring the soil around the bushes seems to be the most effective way to deal with this pest.

Yakima Valley has one of the finest crops of Winesaps ever produced. The fruit is not only larger but firmer in quality and more highly colored.

### Better Apples

By F. D. Garrison, Georgia

**R**EALIZING the responsibility of growing a 60,000 apple tree orchard, I decided to visit some of the older orchards of the East in order that I might study their system of management as to the selection and preparation of soil, varieties used, methods of cultivation, marketing and the problems in general that confront the apple grower.

On this tour a very interesting call was made near Timberville, Virginia, an attractive little town located on the Southern Railway. It has a large mutual cold storage plant, a mutual creamery and other commercial enterprises. I soon learned that this was a promising fruit growing section and about three miles out I found an interesting orchard belonging to Dr. Kelley, who has had years of experience in the fruit growing world. The Mt. Clifton orchard, which has been paying large dividends for several years, was grown and developed by him before he began his present proposition.

The orchard on which he now lives and to which he is giving his personal attention lies on parallel ridges having an elevation of 1,560 feet. The gravel loam soil has a clay subsoil, a great per cent of which is the shale type.

The varieties of fruits used here are Yorks, Staymens, Winesaps, Gravensteins and Black Twigs, with peach trees between every two trees and also between every two rows as fillers. These are Elbertas, Salways, Smocks, Carmans, Belle of Georgia, Old Mixons and the Fox. I was somewhat surprised to learn from the owner that these peaches in their fourth year were paying a dividend over and above the running expenses of the entire orchard. As many as three crates were gathered from one tree while I stood near by.

Upon my inquiry as to the cause for the trees doing so well in a soil that I would consider only fair, Dr. Kelley said: "When I planted this orchard I was planning to sell it, so I wanted to make the trees do their best. I was digging large holes at a heavy expense here on this heavy shale soil and had

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## ONE MAN

does the spraying instead of two, three or four as formerly—does the work thoroughly and in less time. A single shot to a tree is often sufficient, then you are ready to move on to the next one. The MYERS SPRAY GUN is mechanically correct—a product of experts who have simplified the construction by employing common sense ideas which make it exceptionally easy to handle and operate. One-third turn of handle adjusts the Myers Gun from a broad fan-like spray to a long one for high trees. Each gun is provided with three spray discs—4, 6 and 8 gallons capacity, enabling it to utilize full discharge of any pump.

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about 3,000 dug, when Professor Baskerville came along and shot a few holes with dynamite, merely to demonstrate how it would loosen the ground. I could feel the ground loosen and rise when the explosion would go off, and through a curious half interest asked Baskerville to spend the night. Early the next morning we went to the field and he showed some of the men how to use dynamite, as it was the first used in this section. While the demonstration was going on, one of the onlooking laborers was heard to remark, "That young man is going to beat us all out of a job."

Dr. Kelley said that when he had seen the rapidity of shooting holes and the extent to which it loosened the soil, he paid his men at 9 o'clock for a full day and told them he would not need them again until his dynamite could come, as he was ordering that day enough to shoot 30,000 holes, including enough to use in the 3,000 already dug. I was surprised to see the trees on one row which had not been dynamited one-third smaller than the others and in a neighboring orchard one year older, but where dynamite had not been used, the trees were not even bearing.

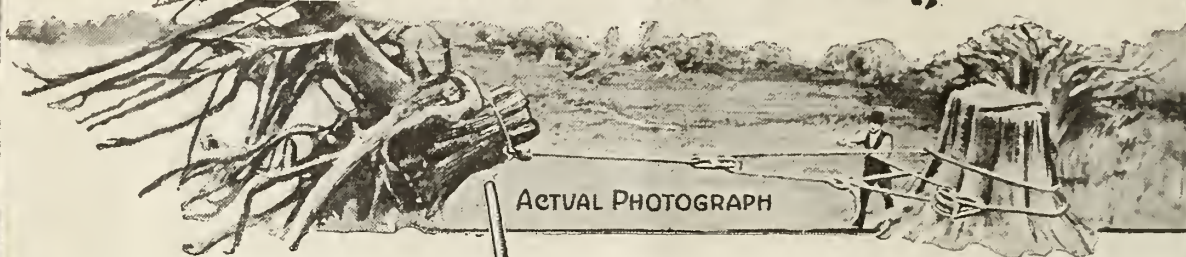
Like everything else, the fruit industry requires careful study, planning, concentrated interest and an open mind. This is being given it and it is justly attracting considerable attention in the business world. It might be interesting to mention something of sales. A. R. Kinser, near Timberville, has an orchard of 1,500 peach trees and 2,000 apple trees on 125 acres. The apple trees are from six to twelve years of age, and at that age paid for land, orchard and equipments prior to that year, 1915.

The gross amount received from the sale of apples for the season 1915 from the orchards of Bowles Estate at Colesville, Virginia, containing 10,000 trees, amounted to \$64,943.90. After paying all expenses, including salaries, it netted \$38,000.

The lesson that I brought back from all these observations is that the best that can be done for a tree is poor enough; it is of vital importance to give a tree a good loose soil and cultivate it from the beginning. We must care for the trees early and late before we can expect them to yield handsome dividends.



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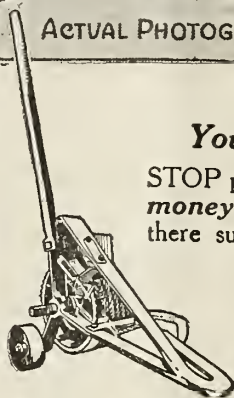
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## Experiments with Nitrate of Soda as a Fertilizer

By Gordon G. Brown, Horticulturist Hood River Experiment Station, before State Horticultural Society at Roseburg, 1918

OWING to the fact that a great deal of our attention at Hood River has been centered upon the problem of maintaining the vigor and productivity of bearing apple trees by the use of nitrate of soda, I take pleasure in reviewing some of our recent observations, hoping that such suggestions may be made as will have wide application. Two years ago I had the pleasure of addressing this society upon this subject, reviewing data as obtained to date. Our problem then was to observe results obtained in orchards which had previous to such applications been in a declining state, as evidenced by a decided lack of vigor and production. Such unsatisfactory conditions obtained because of lack of irrigation or cover crops.

Under the stimulating influences of irrigation, cover crops and nitrate of soda the conditions enumerated have in most cases been entirely or at least very largely overcome. Response from the use of two successive annual applications in early March of five or six pounds nitrate per tree was at once very satisfactory, in that trees quickly regained their lost balance. Vigor as expressed in terminal growth and leaf development exceeded that of unfertilized trees conspicuously. The percentage of fruit set doubled and trebled in many instances, while larger yields of better fruit were in proportion. The first application of such fertilizer was accompanied in very few instances by undesirable results. The second and third applications successively in larger amounts, however, brought to the fore very important questions relative to its

future use. Such problems as the following readily suggested themselves: Leguminous shade crops such as alfalfa or clover having been established in the orchard, what relation do they bear to the use of nitrate or similar artificial fertilizer? Since alfalfa usually occupies the ground for many years, as contrasted with clover, a crop ordinarily turned under for green manure after its second or third season's growth, and accompanied later by clean cultivation, the relation of nitrate to each crop becomes a distinct one in either case. The problem is still further complicated in that it must, at Hood River, be studied with reference to two or more varieties, Spitzenburgs and Newtowns, each representing different growing and producing habits. We are interested in knowing: can nitrate insure us large and regular crops of good quality and may the alternate bearing habits of these varieties be influenced, and to what extent? These are but a few of the more important factors on which information is desired. In dealing with some of these points I shall aim to avoid details in order to be as brief as possible.

Before proceeding further it will be desirable to state briefly the natural handicaps under which we are working. We have stated that both of these varieties are more or less given to alternate bearing. We find that with our Newtowns and Spitzenburgs a close relation exists between previous yields and the percentage of blossoms setting fruit during the subsequent year. We have closely checked upon many different blocks and find the higher the

percentage of fruit set the lower the yields the previous year, or, stating the proposition inversely, the higher the yields this year the lower the percentage of fruit set next year. Again, as might be surmised, smallest yields for the year in which percentages set are taken are associated with smallest percentages set, and vice versa. It appears therefore from what has been said that on an average the capacity of both varieties to set and bear fruit is definitely limited. The data collected point out that the natural tendency is, that should the tree bear very heavily one year the following year is one of reaction, the degree of which is greatly influenced by the quantity of fruit borne during the previous year. The grower of these varieties should keep in mind these natural limitations and govern his orchard practices accordingly. Naturally this fact bears an important relation to the character and extent of pruning, thinning, etc.

We have noted briefly what some of the natural limitations are under which the grower works in dealing with these varieties. Let us see what influence soil culture may exert upon tree performance. The grower readily appreciates the importance of a full bloom. Some are able, assuming a normal season, to make a rough estimate thus early in the year what final yields will be. All will agree that we not only want a tree well filled with blossoms, but we want it filled every year. Further, we would prefer having trees distribute the bloom evenly from year to year, rather than in alternate periods of extremely heavy and extremely light bloom. Such an



arrangement saves in thinning costs, gives higher average yields and is more satisfactory from many standpoints.

Can nitrate influence the tree in this respect? May the average degree of bloom shown by the individual tree from year to year be increased, and to what extent may the well known habit of Spitzenburgs in wide fluctuation be modified? With this point in mind I have kept individual tree records during the past three years. For purposes of comparison the degree of full bloom exhibited by the individual tree has been classified on a percentage basis as follows: 100%, 50%, 20%, 5% and 0%. Briefly, Spitzenburgs receiving two applications of nitrate during the past three years, previous to which lack of irrigation or cover crops prevailed, show considerable difference over trees not fertilized. In the former case trees showed an average bloom of 77% for three years, versus only 64% for the unfertilized trees. There appears to be but slight difference in this respect as between trees receiving two successive annual applications of nitrate and those receiving two applications but with one intervening year during which no fertilizer was applied. Trees receiving as high as seven pounds nitrate per tree show slightly better averages in degree of bloom than those receiving only five or three pounds per tree. Please keep in mind that the trees thus referred to were being rapidly transferred from a state of low vitality and production by repeated applications of nitrate, which under more normal conditions would not have been justified. Furthermore, although clover has been growing between the trees during the past three years it has not yet been turned under. Let us study these trees further. We have seen that the average degree of bloom for three years differed materially. What have the individual trees been doing? To what extent has the tendency to light bloom one year and heavy the next been overcome? Briefly, trees receiving the seven-pound applications show a maximum average variation of 57%; those five pounds, 66%; those three pounds, 70%, while the unfertilized trees show as much as 81%. What of the minimum variation? Trees receiving seven pounds show but 17%; those five pounds, 45%; those three pounds, 65%, versus 66% for the unfertilized trees. Putting the proposition in another way, although heavily nitrated trees have varied as much as 57%, they have also approached within 17% of 0% variation, the assumed ideal. On the other hand, unfertilized trees, although showing as high as 81% maximum variation, have never come closer than 66% of the ideal, or a difference of 49% in this regard in favor of the heavily nitrated trees.

Let us study blooming habits in two other orchards, both of which are now more typical of Hood River conditions. We will call one the clover sod orchard and the other the alfalfa orchard, since the former had clover turned under as a green manure in the spring of 1916 and the other has had alfalfa continuously since the spring of 1915. Both

orchards, with the exception of the check trees in each case, received nitrate in the spring of 1914 and 1915, after which it was decided that no further applications were necessary. This was especially true where clover was turned under, in that all trees, whether fertilized or not, became extremely vigorous. On an average there is little practical difference between any of the plats in either orchard, regardless of whether nitrate had been applied or not. Nor does the general average for one orchard as compared with the other differ materially. It would seem to indicate that where trees are of moderate vigor or above, there is a point beyond which they cannot go, even though given additional nitrate. This was further indicated in 1918 when two of the previously nitrated plats received a third application. However, as has been pointed out for the first orchards referred to, nitrate has exerted a steady influence on bloom from year to year, there being differences of as much as 24% for the clover sod and 18.6% for the alfalfa orchard

in variation, in favor of the fertilized blocks.

We are interested further in knowing how efficient the tree may be in making full use of the amount of bloom available from year to year. There are a number of ways by which this may be measured, but the grower wants to know how yields are influenced, since this is the real measure of success. In dealing with this subject let us again study the first two orchards referred to; those having been brought under the influence of nitrate for the first time in 1916 and where clover has not yet been turned under. Here, higher average yields are associated with heaviest applications put on during the first two years of the experiment, rather than with plats receiving similar amounts but with one intervening year during which no fertilizer was applied. For instance, with Spitzenburgs, two successive annual applications of seven pounds nitrate per tree gave a three-year average of 12.6 loose boxes per tree, versus only 8.5 boxes for trees receiving similar amounts but with the intervening year. With Newtowns a similar relation

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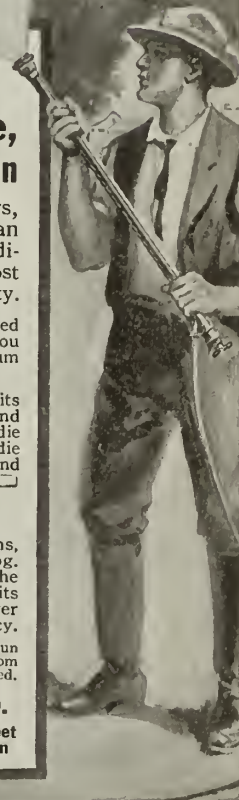
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all admit that the greater part of farm work--discing, harrowing, cultivating, seeding, manure spreading, etc., must be done on plowed or soft ground--also in plowing the low soft spots and hill-sides must be considered.



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holds, in that 11.4 boxes were secured in the former case versus only 8.8 for the latter.

These differences are due not so much to the amount of bloom appearing in the different blocks as to the fact that the former made more effective use of the bloom than the latter. Were we to compare yields from the standpoint of one equivalent percentage of bloom, say 100%, we should find differences are marked in favor of the heavier applications. Under these special conditions, namely, trees much lacking in vitality and productive power due to lack of cover crops and irrigation, there is no question but that trees are able to utilize heavy applications of nitrate at least for the first two years, after which the need of additional fertilizer will vary according to the subsequent soil treatment, irrigation and vigor of tree. The grower will be interested in knowing further that in the orchard where clover has been turned under and in the other where alfalfa has been growing for several years nitrated plats gave increased yields not so much because of better bloom on an average, but because of greatly increased efficiency of the tree to set its fruit and produce larger sizes.

The importance of knowing when to apply nitrate is obvious. When nitrate work was started at Hood River in 1914 it was observed that trees receiving a late application did not make much response until nearly the end of the same growing season. Such applications did not appear to materially influence the set of fruit that year. In 1917 a number

of experiments bearing upon this point were performed. For the work fourteen-year-old Spitzenburgs and Newtowns were chosen. Owing to the lack of previous irrigation and clean cultural methods over a protracted period the trees were badly devitalized and in need of artificial stimulation of this kind. Each variety was divided into five different plats, each of which received  $3\frac{1}{2}$  pounds of nitrate per tree. However, each plat represented applications two weeks apart, ranging in dates from March 6 to May 7, when first and last applications were made. Percentages of fruit set were taken July 25, after the so-called "June drop" was past. It will be recalled that the blossom season in 1917 was extremely late. As may be expected, fruit continued to drop after this date, but the percentages given bear a fairly close relation to yields secured. Newtowns receiving the early application of nitrate not only showed better foliage during the early season, but 50.1% of the blossoms set fruit. Percentages for the other tests, ranging in order of application, are 46.4%, 42.5%, (no record), and only 32.2% for those trees fertilized May 7. Spitzenburgs also showed better colored foliage where receiving early applications. The first trees to receive nitrate show 43.6% set. The other plats show 46.9%, 34.1%, 33.6% and 21.2% respectively, the last figure being associated with trees fertilized May 7. The economic importance of early applications in both cases is thus quite evident, especially in point of yields. The early

fertilized Newtowns averaged 7.9 and Spitzenburgs 10.8 loose boxes per tree, versus only 2.2 and 1.2 boxes for late applications.

The grower who uses nitrate on Spitzenburgs or other colored varieties finds greatest difficulty in securing both size and good color of fruit. Since clover has been turned under in one of the orchards studied there has been much evidence of over-stimulation, especially where nitrate was also used. However, it is fair to say that heavy pruning and irrigation have also been contributing factors. These are the points which the grower himself must work out under his own conditions. On light soils one may use both nitrate and manurial crops with comparative safety, and in many cases it may be necessary, but where heavy soils prevail extreme caution is urged in their use. Here again the grower must decide how much in the way of color he can afford to sacrifice in order to secure increased size and incidentally increased yields. With Newtowns of course the problem is comparatively simple, since the trees are capable of receiving fairly heavy nitrogenous stimulus from time to time and profit from the experience in heavy crops and large sized fruit. On the other hand, it appears that the long continued use of alfalfa as a permanent shade crop is more compatible with results sought. This crop seems to exert a steadying influence in avoiding extremes in tree growth and lends itself to good red color, but often sizes run small. It seems clear that on many soils trees in alfalfa can be with profit further stimulated with nitrate or similar nitrogenous fertilizer. Here again the question of soils plays an important part. On the heavier types one must be very careful not only in the use of nitrate, but also with reference to irrigation, pruning or cultivation.

By special request I am appending before closing a few further remarks regarding the growing of alfalfa in our orchards. In my judgment there is no intercrop for the orchard which has so much to commend it as this one. It produces an immense mass of organic matter, both above and below ground. It is unsurpassed as a soil renovator. It breaks up hardpan and permits of soil aeration. It is stated on good authority that the New Jersey Experiment Station has found that the amounts of plant food gathered by a test acre of alfalfa in two years were equivalent in nitrogen to 2500 pounds of nitrate of soda, in phosphoric acid to 600 pounds of bone black super-phosphate, and in potash to 1200 pounds of muriate of potash.

That alfalfa is filling the bill at Hood River is emphasized by the fact that in most orchards it is now well established. I believe, however, that many mistakes are being made in handling this crop. In the first place, it is often sown upon a poor seed bed, in that weeds or perennial grasses have not been properly suppressed or the ground has not been properly worked. The result is often a poor stand, which in



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its shady and unnatural environment soon becomes weakened and lacking in effectiveness. Such plants are shallow rooted and cannot possibly exert the beneficial influence provided by vigorous, deep-rooted plants. The possibility of stimulating alfalfa growth as well as tree growth by good annual disking or renovating is often overlooked by the grower. There are places in the valley where hogs have been allowed to pasture on this crop and at the same time cultivation and ample irrigation have been withheld. The pasturing in itself is a commendable thing and often highly profitable, but when accompanied by the other conditions just enumerated the ground becomes hard

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Mrs. H. P. Patton, Waverly, Mo., writes "I fed 2 boxes of 'More Eggs' to my hens and broke the egg record. I got 1,500 eggs from 160 hens in exactly 21 days." You can do as well. Any poultry raiser can easily double his profits by doubling the egg production of his hens. A scientific tonic has been discovered that revitalizes the flock and makes hens work all the time. The tonic is called "More Eggs." Give your hens a few cents' worth of "More Eggs," and you will be amazed and delighted with results. "More Eggs" will double this year's production of eggs, so if you wish to try this great profit maker, write E. J. Reefer, poultry expert, 3799 Reefer Building, Kansas City, Mo., for a \$1 package of "More Eggs" Tonic. Or send \$2.25 today and get three regular \$1 packages on special fall discount for a season's supply. A million dollar bank guarantees if you are not absolutely satisfied, your money will be returned on request and the "More Eggs" costs you nothing. You take no risk. Write today. Pin a dollar bill to your letter or send \$2.25 on special discount for 3 packages. Or ask Mr. Reefer to send you free his poultry book that tells the experience of a man who has made a fortune out of poultry.—Adv.

and impervious, and the trees, no matter how gifted by nature, cannot produce profitable crops.

The profitable use of land plaster or sulphur as a fertilizer for this intercrop is also often overlooked, to the ultimate disadvantage of the grower. Oftentimes the fruit grower, in cutting two or three crops of hay, forgets all about his trees. The practice is often carried to the point where it takes keen observation to determine whether he is engaged in hay growing or fruit growing, or both. The presence of a shade crop seems to have a certain psychological effect. The Office of Farm Management of the United States Department of Agriculture found in some Eastern apple sections the tendency was to neglect certain phases of orcharding where clean cultivation had been dispensed with. The practice of cutting hay in the orchard is entirely commendable, but where water is withheld or not available results are disastrous. While it is true that where this crop is allowed to grow up and fall down without cutting, practically no more irrigation is required than where clean cultivation is practised, this idea does not obtain where hay is made. In closing, therefore, let me urge that where alfalfa is expected to exert its best influence keep it vigorous and free from weeds by fertilization when necessary and by thorough annual cultivation. If hay is wanted, do not be afraid of cutting it for fear of robbing the trees, but be sure to give it, as well as the trees, the required moisture. When thus kept at its best the grower may expect excellent returns from his trees.

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Buy a thrift stamp!  
Don't invest your cash in trash,  
Buy a thrift stamp!  
If you want the war to end,  
Take the money you might spend  
Here and there to treat a friend  
And buy a thrift stamp!  
Show your patriotic zeal.  
Buy a thrift stamp!  
Folks will find out how you feel.  
Buy a thrift stamp!  
Close your purse up like a clam  
And you're not helping Uncle Sam.  
Such loyalty is a sham.  
Buy a thrift stamp!

If you think you cannot fight,  
Buy a thrift stamp!  
Get behind the soldiers right.  
Buy a thrift stamp!  
If Germany should win some day,  
They wouldn't hesitate to say  
Just how much you'd have to pay.  
Buy a thrift stamp!  
The President has said to you,  
Buy a thrift stamp!  
Your conscience ought to say it too,  
Buy a thrift stamp!  
Don't sit back and say you'll wait  
Until some more convenient date.  
Then it may be all too late  
To buy a thrift stamp.

### New Method of Preserving Perishable Foods.

As is well known, perishable foods can be preserved by storing them in cold chambers, where the destructive micro-organisms are either killed or maintained in a state of suspended animation. Similar results can be obtained



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with certain gases inimical to the life of the microbes of putrefaction. A gas system invented by a Parsee resident in London, Mr. S. A. Kapadia, M. D., was recently described in *The Times*. According to his method, the storage chambers are filled with a mixture of nitrogen and carbon dioxide, from which very satisfactory results have been obtained. Australian apples stored in this gas for weeks, under the observation of fruit salesmen from Covent Garden, showed no sign of deterioration, while partially rotten apples purposely placed in the middle of the batch had not contaminated the adjacent fruit. Equally good results were obtained with raspberries stored for a fortnight, while fish and eggs have been kept quite fresh for many weeks.—*Chamber's Journal, Edinburgh, March, 1918.*



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### **The Cripple in Fruit Growing**

We have given freely to all the various activities that keep up the efficiency and morale of our soldiers and sailors, but there is still another duty which we owe these men who are sacrificing so much for us. It former times the disabled or crippled soldier was often compelled to eke out his pension with the dolcs of charity. Our allies and ourselves are trying to prevent this condition by re-educating the crippled soldier.

The Vocational Rehabilitation Act recently passed by Congress provides for the re-education of disabled soldiers and sailors, under the joint authority of the Surgeon-General of the Army and the Federal Board for Vocational Education. After a man has been restored to health there are open to him courses in various trades and occupations. These courses are very thorough, and in making his choice he has the help of vocational experts and is guided to what is the most favorable vocation.

We can best help the disabled man by enabling him to secure a position and become a self-respecting, useful citizen. There is no reason why he should not be able to fill any position as efficiently as a normal man, after he has received the proper training and has been fitted with suitable artificial limbs. Of the many industries open to the cripple, fruit growing may be counted on to give employment to a countless number of men.

Men who need outdoor work can do the shipping, packing and marketing of fruits. The French have shown themselves remarkably ingenious in providing artificial aids for the mutilé. A man with one arm can do pruning, grafting, budding, digging, setting out trees and other horticultural and agricultural work. There is really almost no end to

the opportunities open to the man who has been bereft of arm or leg.

Even before the re-education of the war cripple was considered on a large scale by scientific medical men, the idea was constantly cropping out in everyday life. In a Soldiers' Home in the Middle West there was an old fellow with a peg leg who dozed in the sun all day long when the weather permitted and hugged comfortable fires in winter. He was really too feeble to attempt much of anything, but idleness is never satisfying, so he became fretful. One day an attendant who was spraying a hose on a flower bed was called from his work. He espied the old man and said:

"Hey, gran'pap, hold this hose for me a minute!"

Gran'pap held the hose. When the attendant returned the old fellow asked for a sprinkling can and watered some flowers farther away. It was something to do and he liked it. Gradually he worked himself into the task of caring for a certain section of the grounds and in a short time he was a much improved man because of the fresh air and a congenial occupation. He lived on for a decade, happy in his work, which he extended to light tasks during the winter. There are almost innumerable instances of seemingly useless cripples getting back into industry. The carrying out of the idea to cover thousands of war cripples is only an elaboration of what Gran'pap did for himself many years ago.

"A Practical Treatise on the Manufacture of Vinegar" is the title of a publication by William T. Brannet. This work deals not only with the manufacture of vinegar, but it also contains very valuable information on the preserving of fruits and vegetables by canning and evaporation, the preparation of fruit

butters, jellies, marmalades, pickles, etc. It is profusely illustrated, containing 101 engravings, and is full of information that will be valuable and instructive to every fruit grower. It is published by Henry Carey Baird & Co., 110 Nassau Street, New York, who will send circulars on receipt of request.

### **Feeding Prevents Bee Starvation**

This country will need all the surplus honey that the bees can possibly store during the next few years. In view of the sugar shortage, it is important that every colony of bees be encouraged to produce a maximum of honey. Each colony represents a potent plant for the manufacture of sugar substitute. The beekeeper who, through neglect, does not utilize each colony, is contributing to the food shortage just as much as if he destroyed existing supplies.

According to L. Haseman of the University of Missouri College of Agriculture, the period from the latter part of February to the middle of April is one of the most critical of the year for bees in states in the latitude of Missouri. Between the last of February and apple blossom time the weather is usually changeable, and it may become very cold. Normally, the remaining winter stores, together with the nectar collected from the various spring flowers and fruit blossoms, will provide abundant food for building the colony to full strength by the time white clover opens. However, the winter store of honey is shorter than usual, and should the spring supply of nectar be cut short, the beekeeper should ascertain whether any of his colonies are in danger of starvation. Strong as well as weak colonies may be in danger, for the strong ones rear large numbers of brood or young bees, which consume the stores rapidly. A shortage of food encourages robbing, so that the entrances should be restricted, and if feeding becomes necessary, robbing must be guarded against.

An experienced beekeeper may simply lift the hive to determine if it has adequate stores, but a better way is to select a warm day when the bees are active, go through the brood chamber carefully, determine the amount of stores on hand and the extent to which brood rearing has progressed. Those stands which are short of stores should be fed. Honey is the best food for bees, so that if it is possible to take some from colonies which have an excess, exchanging comb, all stands may be properly supplied. Some beekeepers save a few supers of honey for feeding in case of an unfavorable spring.

If honey is not available, sugar syrup should be used. Equal parts by weight of boiling water and pure granulated sugar makes a good honey substitute if it is fed warm. The government, realizing the importance of honey as a human food and the desirability of getting the largest possible crop of honey this year, has approved the use of sugar as food for bees, where they actually need food. However, one must consider what he is feeding for and the effect feeding will have on stimulating



excessive brood rearing. Early overstimulation of brood rearing is unwise where springs are extremely changeable. Feed those stands which are in need of food, and later those which may run short in case of an unfavorable spring nectar flow. Also in feeding use sugar only where honey cannot be given by exchange of combs. In feeding put the food inside the hive and not outside, where it encourages robbing and where the colony needing it most may really get very little of it.

#### Apple Embargo Lifted.

Fruit growers in the Northwest will welcome the news that the embargo on apples to Europe will be removed. This is good news to the apple growers and apple dealers of every section of the country, and while no official notice has been received at this time, many exporters are making application to Washington for export permits. An article recently appeared in one of the daily papers stating that Food Controller Clyne of the British Government had announced in the House of Commons in London that he was arranging for early importations of apples from the United States and Canada, and he would control the price at which they would be sold.


The embargo on apples has been in effect since March, 1917, and has seriously affected some of the apple producing sections, particularly of the Northwest, because the Northwest produces to a high state of perfection a few varieties that are very popular on the English markets. The fruit crop in England and France is very small and it is hoped that exporters will be able to procure space, so that our Allies may have a chance to enjoy some of our apples this season.

Fruit growers of Canyon City and Penrose, Colorado, are trying to enforce compulsory spraying in many of the fruit districts. Pest districts will be established and every orchard owner will be notified to spray at a given time. If the notice is not complied with the orchardist is liable to a fine of from \$25 to \$300, and his orchard will be sprayed and the expense charged to the land in taxes. Many growers have suffered from leaf roller, and it is hoped by this means to check the awful ravages of this pest.

#### How to Sweeten Cranberries

Cranberries are now in the markets. They find a ready place on the table. They always are associated with Thanksgiving and Christmas dinners. This year the scarcity of sugar may cause many to hesitate to use them. Cranberries may be served without emptying your sugar bowl.

Because of the acid content of cranberries, sweeteners such as sorghum, cane or corn syrup may be used even more successfully than with other fruits. Cranberries may be combined with other fruits which are sweet, such as apples, figs and raisins, either to extend or modify the cranberry flavor or to add sweetness to it.



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Cranberries are a valuable food because of the iron and acid they contain. Many like the acid flavor, while others acquire a taste for it. The following are a few of the many ways of using cranberries contained in a bulletin of the United States Food Administration, Division of Home Conservation. The recipes suggested use sugar savers.

**Cranberry Sauce**—Cranberries, 1 qt.; raisins or figs or coconut, 1 cup; water, 3 cups; sorghum or cane syrup, ½ cup. Inspect and wash cranberries. Prepare raisins, cut in small pieces, and add to cranberries and other ingredients, and cook until tender.

**Cranberry Jelly**—Cranberries, 2 qts.; water, 1 qt.; light syrup, 1 to 1½ cups. Cook cranberries in the water twenty minutes. Put through a sieve. This amount should make about one quart of juice and pulp. Add sweetening and cook about ten minutes, or until it will give a jelly. Turn into molds.

**Cranberry Pudding Sauce**—Cranberry juice, 1 cup; syrup, ¾ cup; water, ½ cup; flour, 2 tablespoons; lemon juice, 1½ tablespoons. Mix flour with cold water. Add to juice and sweetening and bring to a boil; cook five minutes; stir constantly. Add lemon juice and serve hot. Use on vanilla cornstarch or steamed puddings.

**Cranberry and Apple Pudding**—Rice, ¾ cup; water, 3 cups; apples, 3 large; cranberries, 1 cup; sorghum or syrup, ¼ cup; raisins (if desired), 2 tablespoons. Steam the rice until soft in a double boiler. Grease a pan and line it

with cooked rice, reserving some for the top. Peel and core the apples and cut the cranberries in halves. Cut the apples into thin slices. Mix the two fruits together and fill the pan, putting a layer of fruit and then a layer of sweetening. Cover the top with a layer of rice. Put on a greased paper and steam ½ to ¾ hour until fruit is quite cooked. Turn out onto a hot dish and serve with custard sauce.

The Oregon State Horticultural Society will hold their thirty-third annual meeting at Roseburg, December 5, 6 and 7. A splendid program has been prepared and every fruit grower in the State of Oregon should make a special effort to attend, because every subject of vital importance in growing, producing and harvesting will be taken up for discussion. The fruit industry is showing a remarkable improvement and every grower should take a keen interest in studying new methods, so that next year he will produce a larger and cleaner crop and receive higher prices.

Olympia, Washington.  
BETTER FRUIT PUBLISHING COMPANY.

Gentlemen: We want to compliment you on the progressiveness of your publication and consider it one of the very best organs in the United States for the building up of the fruit industry in all its branches. The selection of the articles which you publish shows that the editor knows how to get writers who contribute articles of value. Every fruit grower and fruit products manufacturer should give such a magazine as yours constant encouragement and support.

Yours very truly,  
NORTHWEST FRUIT PRODUCTS COMPANY,  
Peter Schmidt, President.



# BLIGHT—The Pear-Growers' Nightmare

This season it is our great good fortune to announce one of the most important discoveries ever made in connection with blight control. If you are interested in pears, you must write now for our new booklet, which describes

## U-SU-RI-EN-SIS

the new, practically blight-proof, Chinese seedling—incomparably superior to the Jap root—by use of which orchards are going to be made 75% blight-proof.

Professor Reimer of Oregon, the highest authority on blight-resistance, recently stated that he believed the least resistant variety of this species more blight-resistant than the most resistant of any other known!

The only stock of U-su-ri-en-sis in an American nursery today is our own limited supply, from which we are reserving enough to plant 60 acres of our own orchard in the spring.

Because we do not know when we can again offer Usuriensis (owing to an uncertain seed supply) and because we desire to supply the requirements of as many orchardists as possible, in order to bring about a wide distribution of this most desirable species, we urge intending planters to send TODAY for the booklet, informing us of their probable planting for 1919.

The booklet may be worth thousands of dollars to you, if you intend to plant a large orchard. It's free, of course, but if you will take the trouble to give us the addresses of a few friends who will plant pears, we will certainly appreciate it.

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## Sulphur Experiments

By R. A. Ward, County Agricultural Agent,  
Redmond, Oregon

THE alfalfa lands of this country have also responded quickly to the use of land plaster as a fertilizer. The land plaster, however, was rapidly exhausted and had to be applied at least once every year. Experiments conducted by the Oregon Experiment Station, and particularly by Mr. Reimer of the branch experiment station at Talent, Oregon, showed that a large proportion of the benefit derived from the land plaster was due to the eighteen pounds of sulphur which it contained and not to the eighty-two pounds of lime. Mr. Reimer also secured some wonderful results in the Medford country, which is 150 miles from Redmond, by the use of pure flowers of sulphur on alfalfa. Following this lead, the office of county agricultural agent experimented with a few sulphur demonstrations in Des Chutes Valley two years ago. The results were so gratifying that the demonstrations were enlarged, during the past season, to take in about fifteen representative farms.

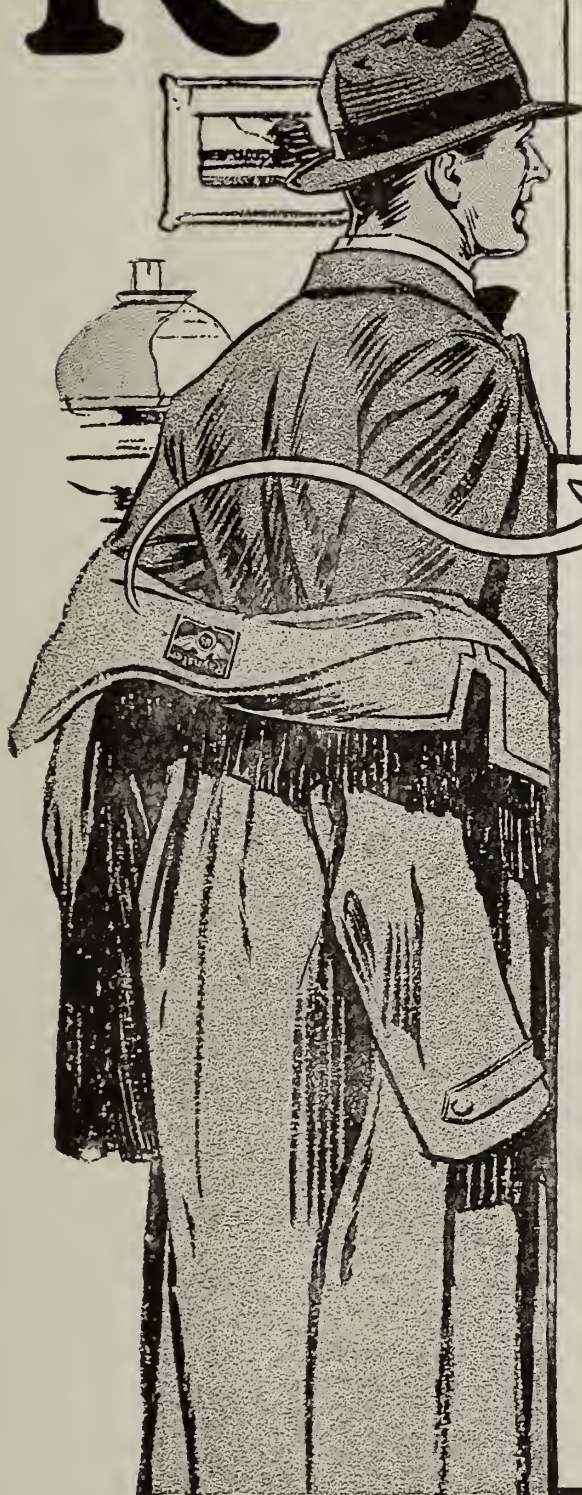
The soil of Des Chutes Valley contains about 6 per cent lime, while it is our understanding that the average lime content for the earth's crust is about 2½ per cent. This being the case, it was poor business on our part to apply land plaster, when the benefits we were deriving were undoubtedly due to the sulphur which it contained. The sulphur in the land plaster being in the sulphate form, was rapidly consumed and exhausted by the plant. In applying the pure flowers of sulphur, this form is broken down gradually into the sulphate form and the process may take two or three years. During this time the beneficial results of the sulphur continue.

Our first applications of sulphur were at the rate of 200 pounds per acre. When applied very early in the season, that is, before the first growth of alfalfa started, the crop increase on each cutting was remarkable. In some cases this amounted to an increase of 100 and 150 per cent on each of the two alfalfa cuttings, not only during the first year it was applied, but also in the second and third years after application. Professor W. L. Powers, of the Oregon Experiment Station, reports the beneficial effects carrying well over into the fourth year in Klamath County. This was a great point in favor of the sulphur. If we could apply it only once in three years, the cost of labor and materials would, of course, be greatly reduced.

The sulphur requirements of alfalfa are much heavier than has been commonly supposed. It is generally recognized today that the amount of sulphur in plant materials, as determined in the ash, is in most cases entirely too low. Analyses by the Osborne method show that the alfalfas and plants of the cabbage family are fairly heavy sulphur consumers. It is held by some investigators that sulphur may be what is known as a limiting factor in plant food supply. That is, there may be sufficient



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**United States Rubber Company**

Clothing Division  
New York and Boston



nitrogen, phosphate and potash in the soil to produce a yield of alfalfa of five tons to the acre, but there may be such a great deficiency in sulphur that this five-ton yield can never be obtained until this sulphur deficiency is supplied. Our demonstrations seem to bear this out. We have several trials where the

yield per acre has been brought up to five tons on land which formerly never exceeded two to three tons per acre per year.

In co-operation with the Oregon Experiment Station, we have conducted trials with the sulphur in comparison with land plaster, nitrate of soda and

super-phosphates, and in every instance the sulphur-treated areas have yielded the greater amount of hay. One trial was conducted in comparison with land plaster applied during the current year against sulphur applied in 1917. The sulphur plot outyielded the land plaster plot by 1,000 pounds to the acre.



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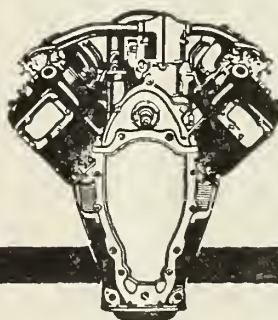
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*The Standard Oil for Motor Cars*

### Correct Lubrication for the "V"-Type Engine

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Seven conclusive experiments completed to date have shown an increase in the yield of hay from the use of sulphur as a fertilizer, ranging from 90 to 150 per cent. Farmers were urged to visit the plots and see the results themselves, or else assist in weighing the experimental yields. The results of the demonstrations were so conclusive that it was decided to make a direct application of them to the entire alfalfa crop of Des Chutes Valley. Accordingly, the Sulphur-Alfalfa Club was organized. Members of this club agreed to take at least 500 pounds of sulphur, and as much more as they wished, and use it on their alfalfa fields during the coming year. They also agreed to report to the county agent the results they obtained by comparing, whenever possible, the yield on five acres of sulphur-treated alfalfa land with the yield on five untreated acres. Membership blanks were prepared and arrangements completed for securing a community shipment.

The first community shipment brought in amounted to about 180,000 pounds, and was secured at a direct saving to the farmers of about \$2,000, by purchasing in large lots direct from the producers. This shipment did not suffice to meet the needs of all of the alfalfa growers, so that at present another shipment of 80,000 pounds is being made up. The total shipments will treat about 3,000 acres of alfalfa, and from the conclusive experiments which have been conducted during the past two years, will result in an increased hay yield in Des Chutes Valley of at least 3,000 tons of hay. This is a very conservative estimate, as actual trials show that the increase in many instances will be more than one ton to the acre per annum. At present hay prices of \$20 per ton for alfalfa in the stack, this will mean \$60,000 worth of new crop in Central Oregon next year.

The flowers of sulphur are applied directly to the soil in amounts ranging from 80 to 100 pounds per acre, and will be put on the land between November 1st of this year and March 1st of next year.

### Spray for San Jose Scale

Orchards which are infested with San Jose scale should be sprayed during the fall, winter or in early spring as growth starts. In most cases the best spray to use is commercial lime-sulphur at the rate of one gallon of the concentrated mixture to seven gallons of water. If the work is done thoroughly, one application is sufficient. In orchards where pruning has been neglected it would be advisable to prune first and then spray. The pruning will rid the trees of the dead limbs and many of the worst infested branches. There will be less surface to cover after pruning and consequently less liquid needed to drench the trees. The pruning will also make the spraying work easier. "Follow the San Jose scale spray with the regular summer sprays and you will be as sure of an apple crop as a corn or wheat crop," says T. J. Talbert, of the University of Missouri College of Agriculture.

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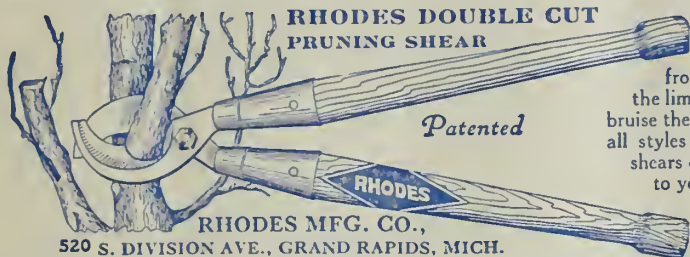
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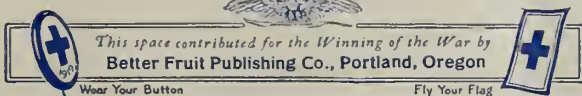
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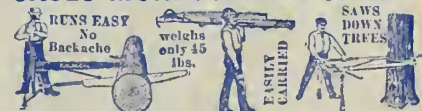
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